In the Claims:

1. (Currently Amended) An optical device, for manipulating incident light of at most a certain maximum wavelength, comprising:

(a) a substantially planar grating including a plurality of electrically conducting stripes and having a space-variant, continuous grating vector, at least a portion of said grating having a local period less than the maximum wavelength of the incident light;

wherein said grating vector is periodic.

2. (Original) The device of claim 1, wherein a magnitude of said grating vector varies laterally and continuously.

3. (Original) The device of claim 1, wherein a direction of said grating vector varies laterally and continuously.

4. (Canceled)

5. (Currently Amended) The device of claim **[[4]]**1, wherein said grating is translationally periodic.

6. (Currently Amended) The device of claim **[[4]]**1, wherein said grating is rotationally periodic.

7. (Original) The device of claim 1, wherein said stripes include a metal.

8. (Original) The device of claim 1, further comprising:

(b) a substrate supporting said stripes.

9. (Original) The device of claim 8 wherein said substrate includes a material selected from the group consisting of gallium arsenide, zinc selenide, quartz and silica glass.

10. (Canceled)

11. (Currently Amended) The device of claim **[[10]]**<u>67</u>, wherein said transmissivity varies periodically in one lateral dimension.

12. (Canceled)

13. (Currently Amended) The device of claim **[[12]]**<u>68</u>, wherein said reflectivity varies periodically in one lateral dimension.

14. (Canceled)

15. (Currently Amended) The device of claim **[[14]]**<u>69</u>, wherein said transmitted beam has an azimuthal angle that varies linearly in one lateral dimension.

16. (Currently Amended) The device of claim **[[14]]**<u>69</u>, wherein said transmitted beam is radially polarized.

17. (Original) The device of claim 16, wherein said radial polarization is in-phase.

18. (Original) The device of claim 16, wherein said radial polarization is anti-phase.

19. (Currently Amended) The device of claim **[[14]]**<u>69</u>, wherein said transmitted beam is azimuthally polarized.

20. (Original) The device of claim 19, wherein said azimuthal polarization is in-phase.

21. (Original) The device of claim 19, wherein said azimuthal polarization is anti-phase.

22. (Canceled)

23. (Currently Amended) The device of claim **[[22]]**<u>70</u>, wherein said reflected beam has an azimuthal angle that varies linearly in one lateral dimension.

24. (Currently Amended) The device of claim **[[22]]**<u>70</u>, wherein said reflected beam is radially polarized.

25. (Original) The device of claim 24, wherein said radial polarization is in-phase.

26. (Original) The device of claim 24, wherein said radial polarization is anti-phase.

27. (Currently Amended) The device of claim **[[22]]**70, wherein said reflected beam is azimuthally polarized.

28. (Original) The device of claim 27, wherein said azimuthal polarization is in-phase.

29. (Original) The device of claim 27, wherein said azimuthal polarization is anti-phase.

30. (Withdrawn)

31. (Currently Amended) A method of cutting a workpiece, comprising the steps of:

(a) providing a beam of light;

(b) imposing radial polarization on said beam of light, using ~~the device of claim 1,~~ an optical device, for manipulating incident light of at most a certain maximum wavelength, that includes a substantially planar grating, said grating including a plurality of electrically conducting stripes and having a space-variant, continuous grating vector, at least a portion of said grating having a local period less than said maximum wavelength of said incident light; and

(c) directing said radially polarized beam at the workpiece to cut the workpiece.

32. (Withdrawn)

33. (Currently Amended) A method of ~~modulating~~ imposing a desired laterally varying modulation on an intensity of laterally uniform, polarized light of at most a certain maximum wavelength, comprising the steps of:

(a) selecting a laterally varying direction β, relative to a reference direction, that defines the modulation;

([[**a**]]b)solving an equation

$$\nabla \times \vec{K}(K_0, \beta) = 0$$

for a grating vector $\vec{K}$ that is defined by a wavenumber K_0 and by [[**a**]] said direction β ~~relative to a reference direction, the modulation depending on β~~, $\vec{K}$ being such that at least a portion of a grating fabricated in accordance with $\vec{K}$ has a local period less than the maximum wavelength of the light;

([[**b**]]c)fabricating said grating in accordance with said grating vector $\vec{K}$; and

([[**c**]]d)directing the light at said grating.

34. (Original) The method of claim 33, wherein said fabricating is effected by forming said grating as electrically conducting stripes on a substrate.

35. (Original) The method of claim 34, wherein said substrate includes a material selected from the group consisting of gallium arsenide, zinc selenide, quartz and silica glass.

36. (Currently Amended) A method of imposing a polarization state having a predetermined, laterally varying azimuthal angle ψ on light of at most a certain maximum wavelength, comprising the steps of:

(a) <u>selecting a grating vector $\vec{K}$ that is defined by a wavenumber K_0 and by a direction β relative to a reference direction, and that defines ψ via an equation $\beta=\psi-\Delta\psi(K_0)$, by</u> solving an equation

$$\nabla \times \vec{K}(K_0, \beta) = 0$$

~~for a grating vector $\vec{K}$ that is defined by a wavenumber K_0 and by a direction β relative to a reference direction, β being related to ψ by $\beta=\psi-\Delta\psi(K_0)$,~~ $\vec{K}$ being such that at least a portion of a grating fabricated in accordance with $\vec{K}$ has a local period less than the maximum wavelength of the light;

(b) fabricating said grating in accordance with $\vec{K}$; and

(c) directing the light at said grating.

37. (Original) The method of claim 36, wherein said reference direction is an x-direction of a Cartesian (x,y) coordinate system, so that K_0 and β satisfy:

$$\frac{\partial K_0}{\partial y}\cos(\beta) - K_0 \sin(\beta)\left[\frac{\partial \psi}{\partial y} - \frac{\partial \Delta\psi}{\partial K_0}\frac{\partial K_0}{\partial y}\right] = \frac{\partial K_0}{\partial x}\sin(\beta) + K_0 \cos(\beta)\left[\frac{\partial \psi}{\partial x} - \frac{\partial \Delta\psi}{\partial K_0}\frac{\partial K_0}{\partial x}\right]$$

38. (Original) The method of claim 36, wherein said reference direction is a radial direction of a polar (r,θ) coordinate system.

39. (Currently Amended) The method of claim **[[38]]**<u>36</u>, wherein said fabricating is effected by forming said grating as electrically conducting stripes on a substrate.

40. (Original) The method of claim 39, wherein said substrate includes a material selected from the group consisting of gallium arsenide, zinc selenide, quartz and silica glass.

41-50. (Withdrawn)

51. (Currently Amended) An optical device, for transforming an incident beam of light into a transformed beam of light, comprising:

(a) a substantially planar grating including a plurality of metal stripes and having a space-variant continuous grating vector, such that the transformed beam is substantially free of propagating orders higher than zero order<u>;</u>

<u>wherein said grating vector is periodic</u>.

52. (Original) The device of claim 51, wherein a magnitude of said grating vector varies laterally and continuously.

53. (Original) The device of claim 51, wherein a direction of said grating vector varies laterally and continuously.

54. (Canceled)

55. (Original) The device of claim 51, wherein said stripes include a metal.

56. (Original) The device of claim 51, further comprising:

(b) a substrate supporting said stripes.

57-60. (Canceled)

61. (Withdrawn)

62. (Currently Amended) A method of cutting a workpiece, comprising the steps of:

(a) providing a beam of light;

(b) imposing radial polarization on said beam of light, using ~~the device of claim 51,~~ an optical device, for transforming an incident beam of light into a transformed beam of light, that includes a substantially planar grating, said grating including a plurality of metal stripes and having a space-varying continuous grating vector, such that the transformed

beam is substantially free of propagating orders higher than zero order;

and

(c) directing said radially polarized beam at the workpiece to cut the workpiece.

63. (Withdrawn)

64. (Currently Amended) A method of transforming an incident beam of laterally uniform, polarized light into a transformed beam having a desired laterally varying modulated intensity, comprising the steps of:

(a) selecting a laterally varying direction β, relative to a reference direction, that defines the modulation;

([[**a**]]b)solving an equation

$$\nabla \times \vec{K}(K_0, \beta) = 0$$

for a grating vector $\vec{K}$ that is defined by a wavenumber K_0 and by [[**a**]] said direction β ~~relative to a reference direction, the modulation depending on~~ ~~β~~, $\vec{K}$ being such that the transformed beam is substantially free of propagating orders higher than zero order;

([[**b**]]c)fabricating ~~said~~ a grating in accordance with said grating vector $\vec{K}$; and

([[**c**]]d)directing the incident beam at said grating.

65. (Original) A method of transforming an incident light beam into a transformed beam upon which is imposed a polarization state having a predetermined, laterally varying azimuthal angle ψ, comprising the steps of:

(a) selecting a grating vector $\vec{K}$ that is defined by a wavenumber K_0 and by a direction β relative to a reference direction, and that defines ψ via an equation $\beta=\psi-\Delta\psi(K_0)$, by solving an equation

$$\nabla \times \vec{K}(K_0,\beta) = 0$$

~~for a grating vector~~ $\cancel{\vec{K}}$ ~~that is defined by a wavenumber~~ $\cancel{K_0}$ ~~and by a direction~~ $\cancel{\beta}$ ~~relative to a reference direction,~~ $\cancel{\beta}$ ~~being related to~~ $\cancel{\psi}$ ~~by~~ $\cancel{\beta=\psi-\Delta\psi(K_0)}$~~,~~ $\vec{K}$ being such that the transformed beam is substantially free of propagating orders higher than zero order;

(b) fabricating ~~said~~ a grating in accordance with $\vec{K}$; and

(c) directing the incident beam at said grating.

66. (Withdrawn)

67. (New) An optical device, for manipulating incident light of at most a certain maximum wavelength, comprising:

(a) a substantially planar grating including a plurality of electrically conducting stripes and having a space-variant, continuous grating

vector, at least a portion of said grating having a local period less than the maximum wavelength of the incident light;

wherein said grating is operative to pass laterally uniform, polarized incident light with a predetermined, laterally varying transmissivity.

68. (New) An optical device, for manipulating incident light of at most a certain maximum wavelength, comprising:

(a) a substantially planar grating including a plurality of electrically conducting stripes and having a space-variant, continuous grating vector, at least a portion of said grating having a local period less than the maximum wavelength of the incident light;

wherein said grating is operative to reflect laterally uniform, polarized incident light with a predetermined, laterally varying reflectivity.

69. (New) An optical device, for manipulating incident light of at most a certain maximum wavelength, comprising:

(a) a substantially planar grating including a plurality of electrically conducting stripes and having a space-variant, continuous grating vector, at least a portion of said grating having a local period less than the maximum wavelength of the incident light;

wherein said grating is operative to transform light incident thereon into a transmitted beam having a predetermined, laterally varying polarization state.

70. (New) An optical device, for manipulating incident light of at most a certain maximum wavelength, comprising:

(a) a substantially planar grating including a plurality of electrically conducting stripes and having a space-variant, continuous grating vector, at least a portion of said grating having a local period less than the maximum wavelength of the incident light;

wherein said grating is operative to transform light incident thereon into a reflected beam having a predetermined, laterally varying polarization state.

71. (New) A method of imposing a polarization state having a predetermined, laterally varying azimuthal angle ψ on light of at most a certain maximum wavelength, comprising the steps of:

(a) solving an equation

$$\nabla \times \vec{K}(K_0, \beta) = 0$$

for a grating vector $\vec{K}$ that is defined by a wavenumber K_0 and by a direction β relative to an x-direction of a Cartesian (x,y) coordinate system, so that K_0 and β satisfy:

$$\frac{\partial K_0}{\partial y}\cos(\beta) - K_0 \sin(\beta)\left[\frac{\partial \psi}{\partial y} - \frac{\partial \Delta\psi}{\partial K_0}\frac{\partial K_0}{\partial y}\right] = \frac{\partial K_0}{\partial x}\sin(\beta) + K_0 \cos(\beta)\left[\frac{\partial \psi}{\partial x} - \frac{\partial \Delta\psi}{\partial K_0}\frac{\partial K_0}{\partial x}\right]$$

β being related to ψ by $\beta=\psi-\Delta\psi(K_0)$, $\vec{K}$ being such that at least a portion of a grating fabricated in accordance with $\vec{K}$ has a local period less than the maximum wavelength of the light;

(b) fabricating said grating in accordance with $\vec{K}$; and

(c) directing the light at said grating.

72. (New) An optical device, for transforming an incident beam of light into a transformed beam of light, comprising:

(a) a substantially planar grating including a plurality of metal stripes and having a space-variant continuous grating vector, such that the transformed beam is substantially free of propagating orders higher than zero order;

wherein the transformed beam is a transmitted beam, and wherein said grating is operative to pass laterally uniform, polarized incident light with a predetermined, laterally varying transmissivity.

73. (New) An optical device, for transforming an incident beam of light into a transformed beam of light, comprising:

(a) a substantially planar grating including a plurality of metal stripes and having a space-variant continuous grating vector, such that the transformed beam is substantially free of propagating orders higher than zero order;

wherein the transformed beam is a reflected beam, and wherein said grating is operative to reflect laterally uniform, polarized incident light with a predetermined, laterally varying reflectivity.

74. (New) An optical device, for transforming an incident beam of light into a transformed beam of light, comprising:

(a) a substantially planar grating including a plurality of metal stripes and having a space-variant continuous grating vector, such that the transformed beam is substantially free of propagating orders higher than zero order;

wherein the transformed beam is a transmitted beam having a predetermined, laterally varying polarization state.

75. (New) An optical device, for transforming an incident beam of light into a transformed beam of light, comprising:

(a) a substantially planar grating including a plurality of metal stripes and having a space-variant continuous grating vector, such that the transformed beam is substantially free of propagating orders higher than zero order;

wherein the transformed beam is a reflected beam having a predetermined, laterally varying polarization state.

76. (Original) A method of transforming an incident light beam into a transformed beam upon which is imposed a polarization state having a predetermined, laterally varying azimuthal angle ψ, comprising the steps of:

(a) solving an equation

$$\nabla \times \vec{K}(K_0, \beta) = 0$$

for a grating vector $\vec{K}$ that is defined by a wavenumber K_0 and by a direction β relative to an x-direction of a Cartesian (x,y) coordinate system, so that K_0 and β satisfy:

$$\frac{\partial K_0}{\partial y}\cos(\beta) - K_0\sin(\beta)\left[\frac{\partial\psi}{\partial y} - \frac{\partial\Delta\psi}{\partial K_0}\frac{\partial K_0}{\partial y}\right] = \frac{\partial K_0}{\partial x}\sin(\beta) + K_0\cos(\beta)\left[\frac{\partial\psi}{\partial x} - \frac{\partial\Delta\psi}{\partial K_0}\frac{\partial K_0}{\partial x}\right]$$

β being related to ψ by $\beta=\psi-\Delta\psi(K_0)$, $\vec{K}$ being such that the transformed beam is substantially free of propagating orders higher than zero order;

(b) fabricating a grating in accordance with $\vec{K}$; and

(c) directing the incident beam at said grating.